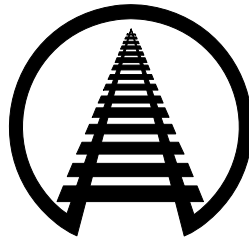


STATEMENT OF
EDWARD R. HAMBERGER
PRESIDENT & CHIEF EXECUTIVE OFFICER
ASSOCIATION OF AMERICAN RAILROADS



BEFORE THE
U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE

HEARING ON CLIMATE CHANGE
AND ENERGY INDEPENDENCE:
TRANSPORTATION AND INFRASTRUCTURE ISSUES

MAY 16, 2007

Association of American Railroads
50 F Street NW
Washington, DC 20001
202-639-2100

The Association of American Railroads (AAR) appreciates the opportunity to address the issue of climate change. AAR members account for the vast majority of freight railroad mileage, employees, and traffic in Canada, Mexico, and the United States.

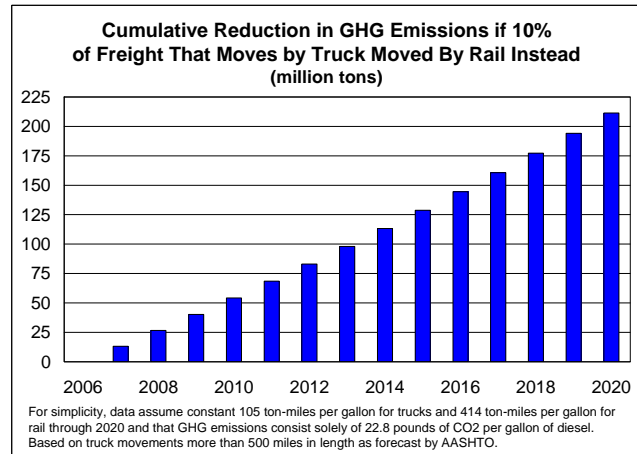
Freight railroads are committed to being part of the solution to the challenge of climate change. Greater use of freight rail offers a simple, inexpensive, and immediate way to meaningfully reduce greenhouse gas (GHG) emissions. Building on its strong record of success, the industry recognizes and accepts its role of delivering continuing environmental improvements while meeting the nation's energy and transportation needs. Going beyond what the law requires, AAR's members plan to pursue further advances, providing tangible improvements in air quality, reductions in GHG emissions, and increased fuel efficiency.

Moving More Freight By Rail Would Reduce GHG Emissions

Freight railroads are the mode of choice for fuel efficiency. Because railroads are, on average, three or more times more fuel efficient than trucks (in terms of ton-miles per gallon) and because GHG emissions are directly related to fuel consumption, every ton-mile of freight that moves by rail instead of truck reduces GHG emissions by two-thirds or more.

Consequently, moving more freight by rail is a straightforward way to meaningfully reduce GHG emissions without negatively impacting our economy. Based on data from the *Freight Rail Bottom Line Report* published by the American Association of State Highway and Transportation Officials (AASHTO), for each 1 percent of the long-haul freight that currently moves by truck that would move by rail instead, fuel savings would be approximately 110 million gallons per year and annual GHG emissions would fall by some 1.26 million tons. Thus, if 10 percent of long-haul freight now moving by truck moved by rail instead, annual GHG emissions would fall by approximately 12.6 million tons.

Because freight transportation demand is expected to rise sharply in the years ahead, future fuel savings — and GHG reductions — would be much higher if more freight moved by rail. For example, AASHTO projected that ton-miles for truck movements of more than 500 miles in length would increase from 1.40 trillion in 2000 to 2.13 trillion in 2020. If 10 percent of truck traffic went by rail — perhaps via efficient intermodal movements in which both railroads and trucks participate —



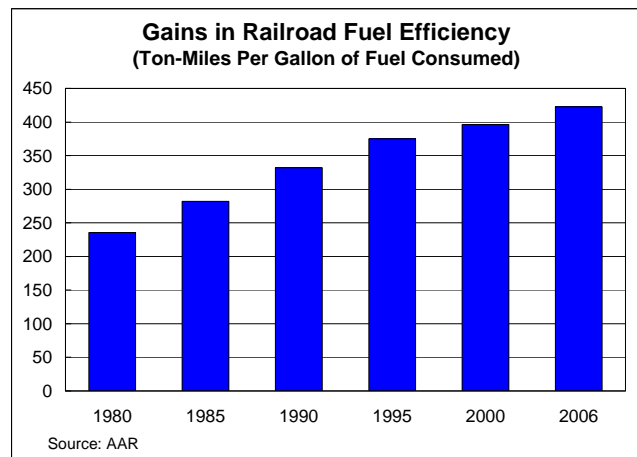
cumulative estimated GHG reductions from 2007 to 2020 would be 211 million tons.

In addition to reducing fuel consumption and GHG emissions, moving more freight by rail would help reduce highway congestion and save fuel that otherwise would be consumed by motor vehicles. According to the Texas Transportation Institute's *2005 Urban Mobility Study*, the annual cost of highway congestion in the United States is \$63 billion just for wasted travel time (3.7 billion hours) and wasted fuel (2.3 billion gallons) sitting in traffic. According to the U.S. Department of Transportation, the total costs of congestion are approximately \$200 billion per year if lost productivity, costs associated with cargo delays, and other items are included. A single intermodal train can take up to 280 trucks off the highways; depending on the type of cargo and the length of a train, other trains can take up to 500 trucks off our highways. Railroads thus help reduce highway congestion, enhance mobility, and reduce the costs of maintaining existing roads and the pressure to build costly new roads.

Policymakers can and should take steps to attract more freight to railroads and expand the GHG-emissions benefits of rail transportation. For example, transportation-related GHG reductions would accrue more quickly if tax incentives for projects that expand rail capacity were instituted and more public-private partnerships for freight railroad infrastructure projects were implemented.

Railroads Are Constantly Working to Improve Fuel Efficiency

U.S. freight railroads have steadily boosted their fuel efficiency. In 1980, one gallon of diesel fuel moved one ton of freight by rail an average of 235 miles. In 2006, the same amount of fuel moved one ton of freight by rail an average of 423 miles — roughly equivalent to the distance from Boston to Baltimore and an 80 percent increase over 1980.



In 2006 alone, U.S. freight railroads consumed 3.3 billion fewer gallons of diesel and emitted 38 million fewer tons of carbon dioxide than they would have if their fuel efficiency had remained constant since 1980. From 1980 through 2006, U.S. freight railroads consumed 44.6 billion fewer gallons of fuel and emitted some 509 million fewer tons of carbon dioxide than they would have if their fuel efficiency had not improved.

The seven U.S. Class I railroads have all joined EPA's SmartWay Transport, a voluntary partnership between freight transporters and the EPA that establishes incentives for fuel efficiency improvements and GHG reductions. The initiative is designed to reduce annual CO₂ emissions by 36 to 73 million tons and nitrogen oxide (NO_x) emissions by up to 220,000 tons. As part of the partnership, each railroad has committed to evaluating the

environmental impacts of its operations and agreed to work with the EPA to develop and implement plans to improve fuel efficiency and reduce emissions in coming years.

Already railroads use technology, training, and changes in operating practices to curb fuel consumption. For example:

- *New locomotives.* Railroads have spent billions of dollars in recent years on thousands of advanced locomotives that are far more environmentally friendly than older models. Railroads have also overhauled or rebuilt thousands of older locomotives to update their performance and environmental friendliness. Many of the new locomotives are high-horsepower units that pull freight over long distances. For example, one major locomotive manufacturer recently began commercial production of 12-cylinder long-haul locomotives that produce the same 4,400 horsepower as the company's 16-cylinder predecessor while saving substantial amounts of fuel and dramatically reducing particulate and nitrogen oxide emissions.

Some new switching locomotives that are used to assemble and disassemble trains in railroad yards are "genset" (generator set) switchers that sharply reduce fuel consumption and emissions. Gensets have two or three independent engines that cycle on and off, depending upon need. If load conditions are such that one engine can handle the task, just one is engaged; if loads are heavier, other engines switch on.

Some switching locomotives are hybrids — *i.e.*, they have a small fossil-fueled engine in addition to a large bank of rechargeable batteries. Hybrid switchers can save up to half the fuel of conventional switchers while releasing a fraction of smog-inducing emissions. Research is ongoing on advanced hybrid technology for long-haul locomotives that will store energy captured during braking for later use.
- *Locomotive monitoring systems.* Railroads are using and further developing sophisticated on-board locomotive monitoring systems that gather and evaluate information on train location, topography, track curvature, train length and weight, locomotive condition, and more to provide engineers with real-time "coaching" on optimum speed for that train from a fuel and operational standpoint.
- *Training.* Railroad fuel efficiency in many cases is directly related to how well a locomotive engineer handles a train, which is why railroads are also using the skills of their engineers to save fuel. For example, railroads commonly offer programs through which engineer peer trainers and simulators provide fuel-saving tips. On one railroad, the fuel consumption performance of participating engineers in the same territory is compared, with awards given to the top "fuel masters."

- *Information technology.* Railroads use advanced computer modeling software in a wide variety of ways to improve their operational efficiency and, therefore, their fuel efficiency. For example, railroads use sophisticated software that identifies the best ways to sequence cars in a large classification yard. The result is more efficient, faster yard operations.

Railroads are also designing, implementing, and improving “trip planning” systems that automatically incorporate and analyze a mix of ever-changing variables (*e.g.*, crew and locomotive availability, terminal congestion, the priority status of different types of freight, track conditions, etc.) to optimize how and when cars are assembled to form trains and when those trains depart. The result is smoother traffic flow, better asset utilization, and lower fuel use.

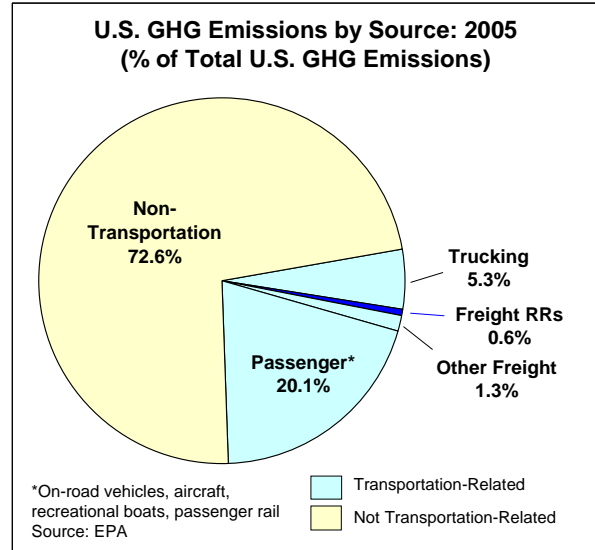
- *Reduced idling.* Historically, locomotive engines have often had to idle when not in use to prevent freezing of the coolant (most do not have anti-freeze), charge batteries and air reservoirs, prevent possible difficulty in restarting, and provide for crew comfort. To help reduce emissions and save fuel, railroads have widely implemented “stop-start” idling-reduction technology that allows main engines to safely shut down when ambient conditions are favorable. One advantage of “genset” locomotives is that their smaller engines use anti-freeze, thus allowing them to shut down in cold weather. Some railroads also use auxiliary power units, which warm engines so that locomotives can be shut down even in cold weather.
- *Freight car and locomotive components and design.* Railroads are utilizing innovative car and locomotive components to help achieve fuel-conservation goals. For example, low torque bearings help reduce bearing drag, saving energy in the process. Advanced top-of-rail lubrication reduces wheel and rail friction and wear and, in turn, fuel use. Lighter freight cars mean less fuel consumed to move a given amount of freight. And railroads are making design improvements — *e.g.*, improving the aerodynamic profile of trains — to save fuel.

Freight Railroads Account For a Small Share of U.S. GHG Emissions

According to EPA data, in 2005 total U.S. greenhouse gas emissions were 7,260 teragrams of CO₂ equivalents (TgCO₂Eq), of which transportation accounted for 28 percent.¹ The vast majority of transportation-related GHG emissions are due to fossil fuel consumption — mainly gasoline, diesel fuel, and aviation fuel.

¹ EPA – *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2005*, Table ES-7. Because some gases have a higher global warming potential than others, emissions of greenhouse gases are typically expressed in a common metric (TgCO₂Eq) so that their impacts can be directly compared.

According to the EPA, in 2005 freight railroads accounted for 44.1 TgCO₂Eq of GHG emissions, equal to 2.2 percent of the transportation-related total and just 0.6 percent of total U.S. GHG emissions. Although freight rail volume rose by 64 percent from 1990 to 2005, freight railroad GHG emissions rose by only 29 percent.



Total U.S. GHG Emissions By Economic Sector: 2005			U.S. GHG by Transportation Sector: 2005		
Economic Sector	Tg CO ₂ Eq.	% of Total	Economic Sector	Tg CO ₂ Eq.	% of Transport.
Electr. generation	2,429.8	33.5%	Trucking	385.8	19.4%
Residential	380.7	5.2%	Freight Railroads	44.1	2.2%
Industry	1,352.8	18.6%	Waterborne Freight	49.9	2.5%
Agriculture	595.4	8.2%	Refrigerated Transport	13.6	0.7%
Commercial	431.4	5.9%	Pipelines	31.1	1.6%
Transportation	2,008.9	27.7%	Aircraft	170.3	8.6%
U.S. Territories	61.5	0.8%	Recreational Boats	14.4	0.7%
Total	7,260.4	100.0%	Passenger Railroads	6.7	0.3%
Data are in teragrams of CO ₂ equivalents.			Pass. Cars & Light Duty Trucks	1,201.4	60.5%
			Buses	15.3	0.8%
			Mobile Air Conditioners	53.1	2.7%
			Total	1,985.7	100%

Source: EPA, *Inventory of U.S. GHG Emissions and Sinks: 1990-2005*, Table ES-7, A-110, and A-111
Figures for "transportation" in the two tables do not match exactly because of estimation issues.

Conclusion

The amount of carbon dioxide released per unit of transportation service (*i.e.*, per ton-mile) is directly related to the energy efficiency of the mode providing that service. That's why freight railroads are the mode of choice in terms of fuel efficiency and reduced greenhouse gas emissions. Railroads look forward to working with policymakers in Congress, the Administration, and elsewhere to address the challenges of climate change.